CLAIMS

1. An authentication system including a plurality of wireless
IC tags and an authentication apparatus which permits a user
5   to use a function provided by the authentication apparatus if
authenticity of the user is certified by authentication,

the authentication apparatus comprising:

a tag verification information storage unit operable to
store a plurality of pieces of tag verification information for
10   identifying the plurality of wireless IC tags respectively;

a receiving unit operable to wirelessly receive, from
wireless IC tags attached to objects carried by the user, a
plurality of pieces of tag certification information for
identifying the wireless IC tags attached to the objects
15   respectively;

a tag judgment unit operable to judge whether or not a
level of match between the plurality of pieces of tag verification
information and the plurality of pieces of tag certification
information satisfies a predetermined condition; and

20   a permission unit operable to permit a use of the function
if the tag judgment unit judges that the level of match satisfies
the predetermined condition, and

each of the plurality of wireless IC tags comprising:

a tag certification information storage unit operable to
25   store a piece of tag certification information for identifying
a wireless IC tag storing the piece of tag certification

information; and

an output unit operable to output wirelessly the piece of tag certification information.

2. An authentication apparatus which permits a user to use a function provided by the authentication apparatus if authenticity of the user is certified by authentication, the authentication apparatus comprising:

a tag verification information storage unit operable to store a plurality of pieces of tag verification information for identifying a plurality of wireless IC tags respectively;

a receiving unit operable to wirelessly receive, from wireless IC tags attached to objects carried by the user, a plurality of pieces of tag certification information for identifying the wireless IC tags attached to the objects respectively;

a tag judgment unit operable to judge whether or not a level of match between the plurality of pieces of tag verification information and the plurality of pieces of tag certification information satisfies a predetermined condition; and

a permission unit operable to permit a use of the function if the tag judgment unit judges that the level of match satisfies the predetermined condition.

3. The authentication apparatus of Claim 2 further comprising:

an identification information storage unit operable to

store first identification information; and

    a user judgment unit operable to, if the tag judgment unit
judges that the level of match does not satisfy the predetermined
condition, receive second identification information and judge
5   whether or not the first identification information matches the
received second identification information, wherein

    the permission unit permits the use of the function if
the tag judgment unit judges that the level of match does not
satisfy the predetermined condition, and if the user judgment
10 unit judges that the first identification information matches
the received second identification information.

4. The authentication apparatus of Claim 3, wherein
    the first identification information is either (i) first
15 character information being a combination of one or more numerals
and/or one or more alphabets and/or one or more signs or (ii)
first   biological   information   indicating   biological
characteristics of the user,
    the second identification information is either (i) second
20 character information being a combination of one or more numerals
and/or one or more alphabets and/or one or more signs or (ii)
second   biological   information   indicating   biological
characteristics of the user,
    if the user judgment unit receives the second character
25 information, the user judgment unit judges whether or not the
first character information matches the received second

character information, and if the user judgment unit receives the second biological information, the user judgment unit judges whether or not the first biological information and the received second biological information correspond to a same user.

5. The authentication apparatus of Claim 2, wherein
     the plurality of pieces of tag verification information are a plurality of verification ID codes for identifying the plurality of wireless IC tags respectively,
     the plurality of pieces of tag certification information are a plurality of certification ID codes for identifying the wireless IC tags attached to the objects respectively, and
     the authentication apparatus further comprises
     an update unit operable to, if a predetermined condition for update is satisfied, acquire at least two certification ID codes out of the plurality of certification ID codes received by the receiving unit, and update contents of the tag verification information storage unit by storing the at least two acquired certification ID codes into the tag verification information storage unit as verification ID codes.

6. The authentication apparatus of Claim 5 further comprising:
     an identification information storage unit operable to store first identification information; and
     a user judgment unit operable to receive second identification information and judge whether or not the first

identification information matches the received second

identification information, wherein

the predetermined condition for update is that the first

identification information matches the second identification

5   information, and

the update unit updates the contents of the tag

verification information storage unit if the first

identification information matches the second identification

information.

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7. The authentication apparatus of Claim 5 further comprising:

a distance calculating unit operable to calculate values

of a distance between the authentication apparatus and each of

the wireless IC tags from which the plurality of certification

15   ID codes have been received, wherein

the update unit acquires at least two certification ID

codes for which calculated values of the distance are each equal

to or lower than a predetermined value, from the plurality of

received certification ID codes.

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8. The authentication apparatus of Claim 5, wherein

each of the plurality of certification ID codes contains

a type code indicating a type of an object to which a wireless

IC tag identified by the certification ID code is attached,

25   wherein

the update unit acquires at least two certification ID

codes containing a predetermined type code, from the plurality
of certification ID codes received by the receiving unit.

9. The authentication apparatus of Claim 8 further comprising:

5   a priority level storage unit operable to store a plurality
of priority levels with a plurality of type codes corresponding
thereto, wherein

     the predetermined type code is correlated with priority
levels that are equal to or higher than a priority-level threshold

10   value, and

     the update unit acquires at least two certification ID
codes that have priority levels that are equal to or higher than
the priority-level threshold value, from the plurality of
certification ID codes received by the receiving unit, and

15   updates contents of the tag verification information storage
unit by storing the at least two acquired certification ID codes
into the tag verification information storage unit as
verification ID codes by priority.

20   10. The authentication apparatus of Claim 9 further comprising:

     a priority level update unit operable to receive a type
code and a priority level, and update the priority level storage
unit by replacing a priority level, which is stored in the priority
level storage unit in correspondence with the received type code,

25   with the received priority level.

11.   The authentication apparatus of Claim 8 further comprising:
        a point storage unit operable to store a plurality of point
values with a plurality of type codes corresponding thereto,
wherein
        the predetermined type codes are correlated with point
5   values that are equal to or higher than a point-value threshold
value, and
        the update unit acquires at least two certification ID
codes that have point values that are equal to or higher than
10   the point-value threshold value, from the plurality of
certification ID codes received by the receiving unit, and
updates contents of the tag verification information storage
unit by storing the at least two acquired certification ID codes
into the tag verification information storage unit as
15   verification ID codes by priority.

12.   The authentication apparatus of Claim 11 further
comprising:
        a point update unit operable to receive a type code and
20   a point value, and update the point storage unit by replacing
a point value, which is stored in the point storage unit in
correspondence with the received type code, with the received
point value.

25   13.   The authentication apparatus of Claim 2, wherein
        the plurality of pieces of tag verification information

172

are a plurality of pieces of unique authentication data for

verification assigned by the authentication apparatus,

the plurality of pieces of tag certification information

are a plurality of pieces of unique authentication data for

5 certification assigned by the authentication apparatus,

the receiving unit wirelessly receives, from the wireless

IC tags attached to the objects, a plurality of ID codes for

identifying the wireless IC tags attached to the objects

respectively;

10   the authentication apparatus further comprises:

an update unit operable to, if a predetermined condition

for update is satisfied, generate a different piece of

authentication data for each ID code received by the receiving

unit, acquire at least two pieces of authentication data from

15 pieces of generated authentication data, and update contents

of the tag verification information storage unit by storing the

at least two pieces of acquired authentication data into the

tag verification information storage unit as authentication data

for verification; and

20   a transmission unit operable to transmit, for each piece

of authentication data for verification having been updated by

the update unit, a piece of authentication data for verification

as a piece of authentication data for certification, to a wireless

IC tag having an ID code corresponding to the piece of

25 authentication data for verification.

14. The authentication apparatus of Claim 13 further

comprising:

an identification information storage unit operable to

store first identification information; and

5   a user judgment unit operable to receive second

identification information and judge whether or not the first

identification information matches the received second

identification information, wherein

the predetermined condition for update is that the first

10   identification information matches the second identification

information, and

if the first identification information matches the second

identification information,

the update unit updates the contents of the tag

15   verification information storage unit, and

the transmission unit transmits, for each piece of

authentication data for verification having been updated by the

update unit, a piece of authentication data for verification

as a piece of authentication data for certification, to a wireless

20   IC tag having an ID code corresponding to the piece of

authentication data for verification.

15. The authentication apparatus of Claim 13 further

comprising:

25   a distance calculating unit operable to calculate values

of a distance between the authentication apparatus and each of

the wireless IC tags from which the plurality of ID codes have been received, wherein

the update unit acquires at least two pieces of authentication data corresponding to ID codes for which

5   calculated values of the distance are each equal to or lower than a predetermined value, among the plurality of received ID codes.

16.   The authentication apparatus of Claim 13, wherein

10   each of the plurality of ID codes contains a type code indicating a type of an object to which a wireless IC tag identified by the ID code is attached, wherein

the update unit acquires at least two pieces of authentication data corresponding to ID codes that include a

15   predetermined type code among the plurality of ID codes received by the receiving unit.

17.   The authentication apparatus of Claim 2, wherein

each of the plurality of pieces of tag certification

20   information contains a type code indicating a type of an object to which a wireless IC tag identified by the piece of tag certification information is attached, wherein

the tag judgment unit judges whether or not a level of match between the plurality of pieces of tag verification

25   information and one or more pieces of tag certification information, which remain after excluding, from the plurality

of pieces of tag certification information received by the receiving unit, pieces of tag certification information that contain a predetermined type code, satisfies a predetermined condition.

18. The authentication apparatus of Claim 2, wherein
the tag verification information storage unit further stores expiration date/time information that indicates an expiration date/time of each piece of tag verification information, and
the authentication apparatus further comprises
a control unit operable to, if having judged that any expiration date/time of the plurality of pieces of tag verification information has not been reached, control the receiving unit to receive the plurality of pieces of tag certification information.

19. The authentication apparatus of Claim 2, wherein
the tag judgment unit judges whether or not a ratio of (i) a number of pieces of tag verification information that, among the plurality of pieces of tag verification information, match any of the plurality of pieces of tag certification information to (ii) a total number of the plurality of pieces of tag verification information stored in the tag verification information storage unit is equal to or higher than a standard value.

20. The authentication apparatus of Claim 2, wherein

the tag verification information storage unit further stores point values indicating weights assigned to the plurality

5 of pieces of tag verification information, in correspondence with the plurality of pieces of tag verification information, and

the tag judgment unit judges whether or not a ratio of (i) an acquired point value that is obtained by adding up point

10 values corresponding to pieces of tag verification information that, among the plurality of pieces of tag verification information, match any of the plurality of pieces of tag certification information to (ii) a total point value that is obtained by adding up point values corresponding to the plurality

15 of pieces of tag verification information stored in the tag verification information storage unit is equal to or higher than a standard value.

21. The authentication apparatus of Claim 2, wherein

20 the tag verification information storage unit is a portable recording medium, and

the portable recording medium is inserted in the authentication apparatus.

25 22. An authentication method for an authentication apparatus which permits a user to use a function provided by the

authentication apparatus if authenticity of the user is certified

by authentication,

the authentication apparatus comprising:

a tag verification information storage unit operable to

5   store a plurality of pieces of tag verification information for

identifying a plurality of wireless IC tags respectively, and

the authentication method comprising the steps of:

wirelessly receiving, from wireless IC tags attached to

objects carried by the user, a plurality of pieces of tag

10   certification information for identifying the wireless IC tags

attached to the objects respectively;

judging whether or not a level of match between the

plurality of pieces of tag verification information and the

plurality of pieces of tag certification information satisfies

15   a predetermined condition; and

permitting a use of the function if it is judged in the

above step that the level of match satisfies the predetermined

condition.

20   23. An authentication program for an authentication apparatus

which permits a user to use a function provided by the

authentication apparatus if authenticity of the user is certified

by authentication,

the authentication apparatus comprising:

a tag verification information storage unit operable to

25   store a plurality of pieces of tag verification information for

identifying a plurality of wireless IC tags respectively, and

the authentication program comprising the steps of:

wirelessly receiving, from wireless IC tags attached to objects carried by the user, a plurality of pieces of tag

5   certification information for identifying the wireless IC tags attached to the objects respectively;

judging whether or not a level of match between the plurality of pieces of tag verification information and the plurality of pieces of tag certification information satisfies

10   a predetermined condition; and

permitting a use of the function if it is judged in the above step that the level of match satisfies the predetermined condition.

15   24. A computer-readable recording medium recording therein an authentication program that causes a computer to operate as an authentication apparatus which permits a user to use a function provided by the authentication apparatus if authenticity of the user is certified by authentication,

20   the authentication apparatus comprising:

a tag verification information storage unit operable to store a plurality of pieces of tag verification information for identifying a plurality of wireless IC tags respectively, and

the authentication program comprising the steps of:

25   wirelessly receiving, from wireless IC tags attached to objects carried by the user, a plurality of pieces of tag

certification information for identifying the wireless IC tags

attached to the objects respectively;

judging whether or not a level of match between the

plurality of pieces of tag verification information and the

5   plurality of pieces of tag certification information satisfies

a predetermined condition; and

permitting a use of the function if it is judged in the

above step that the level of match satisfies the predetermined

condition.